

APPENDIX
Serial No. 10/050,565

(RE: OUR COMMENTS TO RESPONSE TO THE OFFICE ACTION).

1. THE FOLLOWING DESCRIPTION EXPLAINS THE MECHANISM OF THE PROTECTING CAP STRUCTURE FOR THE NEEDLE OF A SYRINGE OF THE PRESENT INVENTION

The protecting cap structure for the needle of a syringe is provided with a protecting sleeve, which is comprised of a foldable cover and a cylindrical extendible member. The cylindrical extendible member is a hollow cylinder, which has a shank. The shank of the cylinder extendible member has a compression portion.

The folded cover 11 is in the shape of a semi-cylinder. One end of the cover 11 is connected with the cylindrical extendible member 12. The inner diameter of the cover 11 is slightly larger than the external diameter of the cylindrical extendible member 12. The cover 11 is provided on the two sides thereof each with an engaging notch 112, and is provided on the wall thereof with an engaging hole 111 (in fact, the number of the engaging notch can be at least one totally for the two sides). When the cover 11 is folded to close, it can be engaged with the hooking strip 125 provided on the bottom wall portion of the cylindrical extendible member 12.

The cylinder extendible member 12 is a hollow cylinder, the shank thereof has a compression portion 121 with a suitable length; a pair mutually opposite foldable portions 122 slightly bending outwardly in favor of folding are provided in neighboring to the compression portion 121. The cylindrical extendible member 12 has on the bottom wall portion thereof a protrusion 123, and a corresponding foldable extension section 128 is provided also on the bottom wall portion of the cylindrical extendible member 12, the foldable extendible section 128 is provided with a through hole 124 for engagement; a hook strip 125 is provided on the bottom wall portion of the cylindrical extendible member 12. A hold 126 is provided on the top of the cylindrical extendible member 12, which has an annular flange 127 on the top.

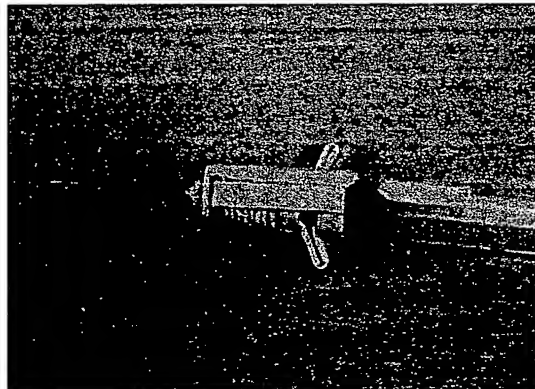
2. THE FOLLOWING DESCRIPTION OF THE PRIOR ART:

Ward discloses a passively activated safety needle assembly comprising a needle cannula and a shield assembly. The needle cannula with opposite proximal and distal ends. The shield assembly has a safety shield slidably mounted on the needle cannula and movable

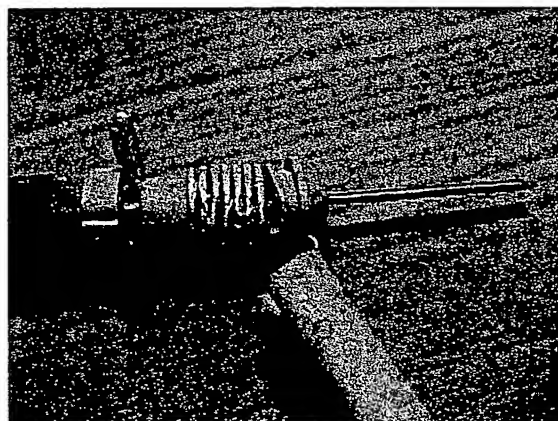
from a proximal position substantially adjacent said proximal end of said needle cannula to a distal position surrounding said distal end of said needle cannula. The shield assembly further comprising a plurality of hingedly connected arms with at least two arms being hingedly connected at a hinge connection extending between the safety shield and a location in proximity to the proximal end of the safety shield along the needle cannula..

3. THE DIFFERENCES BETWEEN THE PRESENT INVENTION AND THE PRIOR ART:

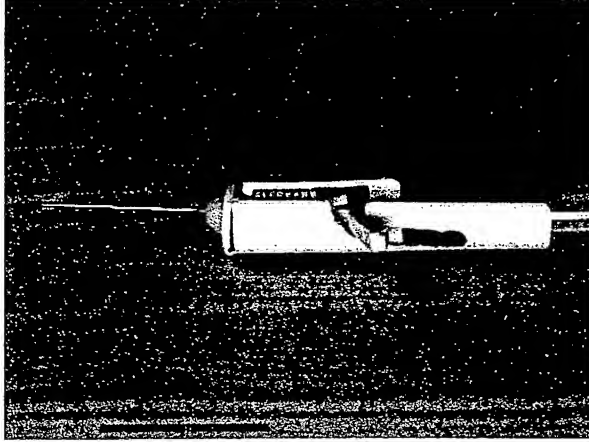
In this present invention, the compression portion of the cylindrical extendible member occupies a portion of the needle length when compressed alone, folding of the foldable arms retracts the compression portion further so that the needle (without any increased in length) will be exposed nearly 80% of its length.



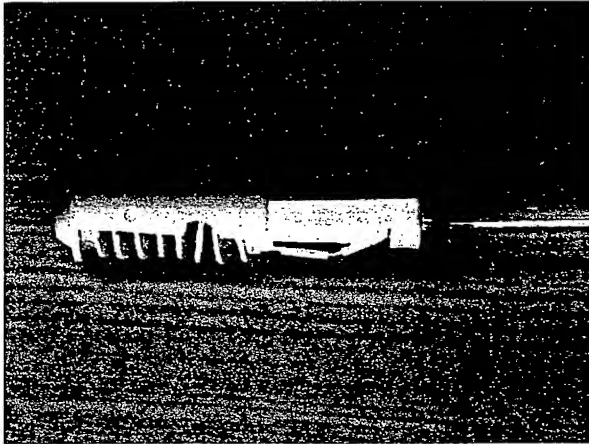
In order to achieve the effective retraction without increasing the length of the needle, the present invention anchors the base of the cylindrical extendible member at the hub of the needle at its most proximal end. By this way most of the retracted portion will lie proximal to the needle, occupying mostly only the hub portion of the needle.



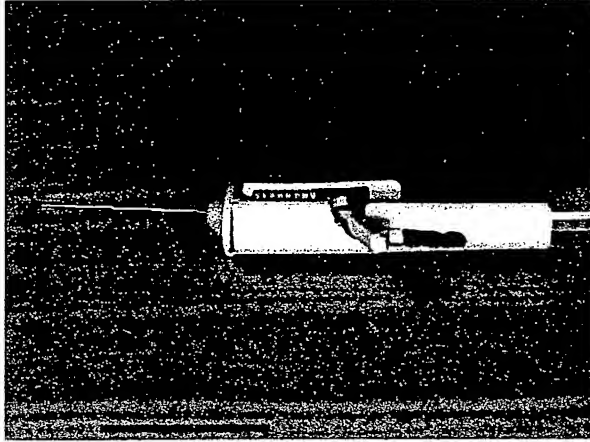
- (2) The engaging notch over the cover allows the foldable portion to protrude during retraction.



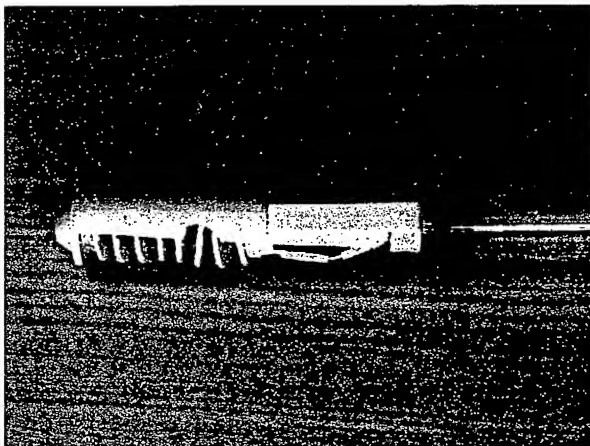
- (3) The hole over the cover functions as a keyhole to lock with the lock strip during shipment or at disposal. It needs two steps (picking up the lock strip and turning the cover along the long axis) to unlock so that it can prevent being accidentally unlocked.



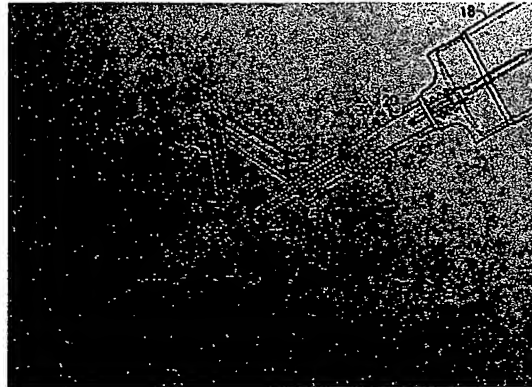
- (2) The engaging notch over the cover allows the foldable portion to protrude during retraction.



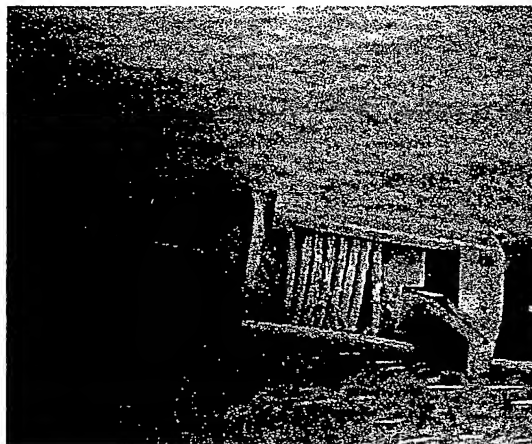
- (3) The hole over the cover functions as a keyhole to lock with the lock strip during shipment or at disposal. It needs two steps (picking up the lock strip and turning the cover along the long axis) to unlock so that it can prevent being accidentally unlocked.



Ward's invention actually is to cover the pointed end of the needle with shield assembly. But the shield assembly itself occupies most of the needle length during retracted state so needle length needs to increase to accommodate the shield. This will force the user to use a longer needle than the conventional one, causing addition cost, and clumsiness during manipulation.

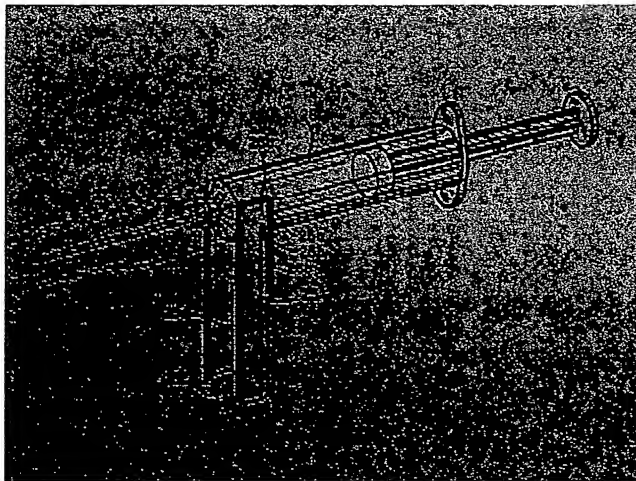
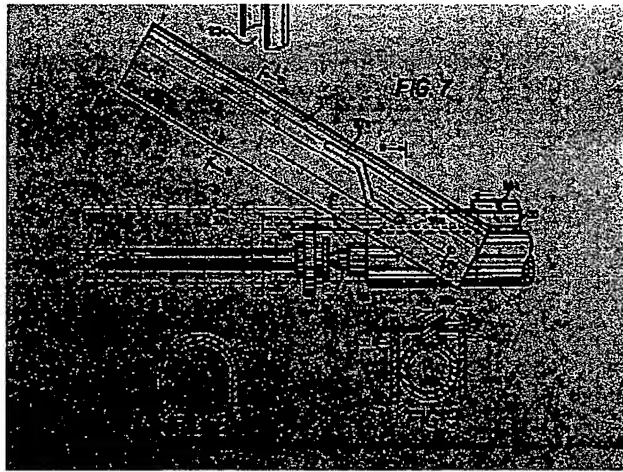


This present design not only has more effective retraction but also has more stable structure, because it has shorter range of movement of each portion (the compression portion and the foldable portion) over a broader base.



Addition of the hook strip also makes the retracted state more stable in this invention by preventing the compression portion to extend accidentally before the procedure comes to an end.

In Luther's or Olson's invention the cover is pivotally swinging to cover the already exposed needle. It is clumsy to have a swing out component during manipulation. Both of their invention need a special needle or syringe having trunnion studs for pivotal movement. The locking mechanisms are also different from the present invention that only one step is needed to unlock which cannot prevent being accidentally unlocked.



4. THE ADVANTAGES OF THE PROTECTING CAP STRUCTURE FOR THE NEEDLE OF A SYRINGE OF THE PRESENT INVENTION:

- (1) By integrating the compression portion, the foldable portion with lock strip and the semi-cylindrical cover, the stableness of the present invention is effectively improved.
- (2) By having the compression portion and foldable portion, the present invention is applicable to expose various length of needle by manipulating each portion or both in succession.
- (3) Because each portion moves only a short guarded distant step by step along the needle axis there is less chance of distortion during manipulation.
- (4) By having the compression portion and the foldable portion, the present invention can accompany the needle motion mm by mm to cover the needle, so that the needle-tip will not be expose at all when leaving the skin of the patient.
- (5) The present invention can be used with conventional needles, and there is no need to add or change structures, so it is easier to use, and much more economic.
- (6) All the components are integrated to be guarded by each other along the needle axis so that no redundant part will appear during manipulation to prevent clumsiness.
- (7) After use or during shipment the lock strip of the invention can lock the cover to provide perfect protection for users from any kind of accidental sharp injury.
- (8) Because this embodiment can be manufactured as all in one piece, the production cost is lower than if there are multiple parts to assemble.

5. ATTACHED DATA

- (1) Pictures of the protecting cap structure for the needle of a syringe of the present invention and prior art.
- (2) A VCD of operating the protecting cap structure for the needle of a syringe of the present invention.